

What is claimed is:

## CLAIMS

- 1 1. A method for routing a source routed packet to an SRB subnet for a destination  
2 station, comprising:  
  
3 maintaining an address resolution protocol table (ARP table) in a router having an  
4 entry for each station on said SRB subnet to which said router routes packets, said entry  
5 having a first field containing a Layer 3 address of said station, said entry having a  
6 second field containing a Layer 2 address of said station including a physical (MAC)  
7 address and routing information (RIF information) from said router to said each station;  
  
8 writing said routing information read from said second field of said ARP table  
9 into a RIF in a message packet before routing said message packet to said SRB subnet for  
10 said destination station.
- 1 2. The method as in claim 1 further comprising:  
2 populating said routing information in said ARP table by reading RIF information  
3 from a field of an All Routes Explorer (ARE) packet, either a request or response packet.
- 1 3. The method as in claim 1 further comprising:  
2 populating said routing information in said ARP table by reading RIF information  
3 from a field of an Single Routes Explorer (SRE) packet, either a request or response  
4 packet.

1 4. The method as in claim 1 further comprising:  
2 populating said routing information in said ARP table by reading RIF information  
3 from a field of an ARP Explorer packet, either a request or response packet.

*Sch*  
*AP*

1 5. The method as in claim 1 further comprising: updating said second field of said  
2 ARP table when said router receives an ARP Explorer request packet from a station on  
3 said SRB subnet and said packet contains RIF information.

*Sch*  
*AP*

1 6. The method as in claim 1 further comprising: transmitting an ARP Explorer  
2 request packet upon expiration of an ARP table flush timer, and updating said second  
3 field of said ARP table in response to receipt of an ARP Explorer response packet  
4 transmitted by a station in response to said ARP Explorer request packet.

*Sch*  
*AP*

1 7. The method as in claim 6 further comprising: choosing a time period of four (4)  
2 hours for expiration of said ARP table flush timer.

*Sch*  
*AP*

1 8. The method as in claim 1 further comprising: transmitting a validation frame  
2 upon expiration of a validation time interval, and in the absence of a response from said  
3 validation frame, transmitting an ARP Explorer request packet, and updating said second  
4 field of said ARP table in response to receipt of an ARP Explorer response packet  
5 transmitted by a station in response to said ARP Explorer request packet.

1 9. The method of claim 8 further comprising: choosing a validation time interval of 15  
2 seconds.

*Sch*  
*AP*

1 10. A router comprising:

2       an address resolution protocol table (ARP table), said ARP table maintained in  
3    said router, said ARP table having an entry for each station on a SRB subnet to which  
4    said router routes packets, said entry having a first field containing a Layer 3 address of  
5    said station, said entry having a second field containing a Layer 2 address of said station  
6    including a physical (MAC) address and routing information (RIF information) from said  
7    router to said each station;

8                    a packet format circuit to write required routing information read from said  
9    second field of said ARP table into a RIF in a message packet before routing said  
10   message packet to a destination station on a destination SRB subnet.

1   11. A router for routing a source routed packet to an SRB subnet for a destination,  
2   comprising:

3                    means for maintaining an address resolution protocol table (ARP table) in a router  
4    having an entry for each station on said SRB subnet to which said router routes packets,  
5    said entry having a first field containing a Layer 3 address of said station, said entry  
6    having a second field containing a Layer 2 address of said station including a physical  
7    (MAC) address and routing information (RIF information) from said router to said each  
8    station;

9                    means for writing said routing information read from said second field of said  
10   ARP table into a RIF in a message packet before routing said message packet to said SRB  
11   subnet for said destination station.

1   12. A computer readable device containing a computer program for performing a method  
2   of routing a source routed packet to an SRB subnet for a destination station, comprising:

3        maintaining an address resolution protocol table (ARP table) in a router having an  
4    entry for each station on said SRB subnet to which said router routes packets, said entry  
5    having a first field containing a Layer 3 address of said station, said entry having a  
6    second field containing a Layer 2 address of said station including a physical (MAC)  
7    address and routing information (RIF information) from said router to said each station;

8               writing said routing information read from said second field of said ARP table  
9    into a RIF in a message packet before routing said message packet to said SRB subnet for  
10   said destination station.

13. Electronic data signals received through a port of a router, said electronic data signals  
2    for implementing a method for routing a source routed packet to an SRB subnet for a  
3    destination station, comprising:

4        maintaining an address resolution protocol table (ARP table) in a router having an  
5    entry for each station on said SRB subnet to which said router routes packets, said entry  
6    having a first field containing a Layer 3 address of said station, said entry having a  
7    second field containing a Layer 2 address of said station including a physical (MAC)  
8    address and routing information (RIF information) from said router to said each station;

9               writing said routing information read from said second field of said ARP table  
10   into a RIF in a message packet before routing said message packet to said SRB subnet for  
11   said destination station.

1 14. An ARP table data structure stored in a computer memory of a router, comprising:

an entry for each station on an SRB subnet to which said router routes packets,  
said entry having a first field containing a Layer 3 address of each said station, said entry  
having a second field containing a Layer 2 address of said station including a physical  
(MAC) address and routing information (RIF information) from said router to said each  
station, said routing information in said second field of said ARP table used for writing  
RIF information into a RIF in a message packet before routing said message packet to  
said SRB subnet for said each station.

1 15. The ARP table of claim 1 or claim 10, or claim 11, or claim 12, or claim 13, or claim  
2 14 wherein said Layer 3 address further comprises: an address for an Internet Protocol  
3 (IP) communication session.

1 16. The ARP table of claim 1 or claim 10, or claim 11, or claim 12, or claim 13, or claim  
2 14 wherein said Layer 3 address further comprises: an address for an Appletalk  
3 communication session.

1 17. The ARP table of claim 1 or claim 10, or claim 11, or claim 12, or claim 13, or claim  
2 14 wherein said Layer 3 address further comprises: an address for a connectionless mode  
3 network service communication session.

1 18. The ARP table of claim 1 or claim 10, or claim 11, or claim 12, or claim 13, or claim  
2 14 wherein said Layer 3 address further comprises: an address for a DECnet  
3 communication session.

1 19. The ARP table of claim 1 or claim 10, or claim 11, or claim 12, or claim 13, or claim  
2 14 wherein said Layer 3 address further comprises: an address for an IPX  
3 communication session.

1 20. The ARP table of claim 1 or claim 10, or claim 11, or claim 12, or claim 13, or claim  
2 14 wherein said Layer 3 address further comprises: an address for a XNS communication  
3 session.

1 21. The ARP table of claim 1 or claim 10, or claim 11, or claim 12, or claim 13, or claim  
2 14 wherein said Layer 3 address further comprises: an address for a Vines  
3 communication session.

1 22. The method of claim 1 or claim 12, or claim 13, further comprising: receiving data  
2 by a processor, said data received from a network connection for maintaining said ARP  
3 table, and storing said data in a FLASH memory.

1 23. The router of claim 10 or claim 11, or claim 14, further comprising: a processor  
2 receiving data from a network connection, said data received from a network connection  
3 for maintaining said ARP table, and storing said data in a FLASH memory.